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Montek Division

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LOW TEMPERATURE TEST REPORT FOR THE AN/TRN-41 TACAN NAVIGATIONAL SET

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3. RECIPIENT'S CATALOG NUMBER	
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18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

AN/TRN-41 TACAN Navigational Set

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report describes the low temperature test as defined in the Equipment Test Plan for Navigational Set, TACAN, AN/TRN-41.

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

LOW TEMPERATURE TEST REPORT
for the
NAVIGATIONAL SET, TACAN, AN/TRN-41

This report describes the low temperature test as defined in the Equipment Test Plan for Navigational Set, TACAN, AN/TRN-41, 131500-415.

1. Test Identification. Low temperature test as defined in Appendix IV-A (low temperature test procedure) of the Equipment Test Plan for Navigational Set, TACAN, AN/TRN-41.

2. Functional Purpose of Test. This test forms a part of the AN/TRN-41 system qualification tests.

3. Test Objectives. To demonstrate that the AN/TRN-41 will meet the low temperature requirements of paragraphs 3.2.5.1.1 and 4.2.1.4.3.1 of Specification No. 404L-701-5017A, Part 1 of 2 parts (20 August 1976).

4. Description of Test Article. The AN/TRN-41 system consisting of the following was used for the low temperature tests:

Receiver-Transmitter	RT-1201/T
Antenna	AS-3132/T
Antenna Support	AB-1237/T
Filter, DC Power	F-1439/T
Interconnecting Cables	

5. Summary of Test Results. The AN/TRN-41 showed no functional or physical degradation during the low temperature test.

6. Description of Test Facilities and Procedures. The test facilities and test procedures are described in Appendix IV-A of the Equipment Test Plan.

7. Test Setup Diagrams. The test setup diagrams are provided in Appendix IV-A of the Equipment Test Plan.

8. Test Equipment. See Attachment 1 for test equipment used for the low temperature test, pretest, test, and post-test operational tests.

9. Test Data. Attachment 2 contains the data sheets for the low temperature test, pretest, test and post-test operational tests and the chamber data sheet.

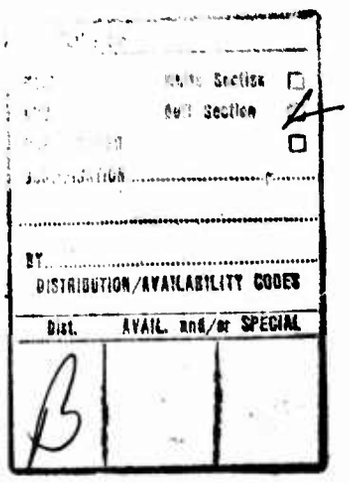
10. Test Conditions. The system was conditioned at -62°C and then operated at -54°C.

11. Test Results and Analysis. On the pre-low temperature operational test, the system would occasionally have an RT alarm. This was caused by the number of pulses being detected in the 6 dB Down Detector CCA 1A7 being too low to keep the reply delay monitor circuit happy. This was corrected by changing selectable resistor 1A7R13 to a value (from 180K to 220K) that would allow the reply delay monitor circuit to operate properly.

The system was started in the low temperature test and experienced an RT alarm at -54°C. There was no output power. The problem was caused by a poor solder connection on the output from the VCO CCA 1A9A4 of the synthesizer. This was repaired.

The low temperature test was repeated and no failures occured and no degradation was observed in the visual inspection.

12. Certification. The data sheets shown in Attachment 2 have been signed by a Montek Quality Assurance representative and a DCAS representative, certifying that the test results are authentic, accurate, current and in accordance with the related test plan.



ATTACHMENT 1

TEST EQUIPMENT

TEST EQUIPMENT

Description/Manufacturer	Model	Calibration Due Date
Oscilloscope, Tektronix	465	7/6/77
Signal Generator, RF, H.P.	612A	6/23/77
Peak Power Meter, HP	8900B	9/19/77
Pulse Generator, Data Pulse	110B	5/12/77
Counter, Fluke	1953	8/12/77
Half-Ampl. Det. Montek	131500-702	N/A
RF Detector, Montek	135203-100	N/A
Monitor Ant., Montek	006300	N/A
Test Box - Interconnection - Montek	131500-703	N/A
Power Supply HP	6274B	1/16/78
Power Supply Acopian		12/9/77
Power Supply, Sorensen	QR4075A	9/19/77
Directional Coupler 20 dB, Narda	3042B	N/A
Directional Coupler 10 dB, Microlab	CBA-78	N/A
Variable Attenuator, Weinschel 0-10 dB	905	N/A
RF Attenuator, Weinschel	10 dB	N/A
Multimeter, Fluke	8120A	8/2/77
Temperature Chamber, Tenney Engineering		
Temperature Recorder and Controller	152P15-Pg-295-111-91	9/9/77

ATTACHMENT 2

DATA SHEETS

APPENDIX IV-K

DATA SHEET
ENVIRONMENTAL TEST

TEST: Low Temperature
SYSTEM: 002

DATE: from 5 May 1977 to 6 May 1977

ACCEPTABLE: X
NOT ACCEPTABLE:

REMARKS: The system was subjected to low temperature tests as outlined by test procedure 131500-415, Appendix IV-A. At the conclusion of the low temperature testing the data was reviewed, there was no degradation of performance observed. No discrepancies were noted during visual inspection.

DISCREPANCIES:

SIGN OFF INFORMATION

ENVIRONMENTAL TEST ENGINEER: _____ DATE: _____

REPRESENTATIVE ENGINEER: R D Dayton DATE: 5-11-77

QA REPRESENTATIVE: M. B. Grant DATE: 5-11-77

DCASD OR AF CONCURRENCE: M. A. Black DATE: 5-11-77

June 30, 1976

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DATA SHEET

OPERATIONAL TESTS

AN/TRN-41

Test Low Temperature

System 002

Date 5/5/77

Time

Tech

Para. No.	Description	5-5-77 Pre Test	5-6-77 Test	Post Test	Requirements	Units
.1	Calibrated RF insertion loss P_L = 32.5 dB Used in determining RF peak power.	N/A	N/A	N/A	N/A	N/A
.2	System turn on normal operation	✓	✓	✓	Check if OK	N/A
.3.1	Antenna radiated signal 15 Hz	✓	✓	✓	Check if OK	N/A
	135 Hz	✓	✓	✓	Check if OK	N/A
.3.2	Antenna Speed	66.668	66.662	66.666	66.667 ± .133	[illegible]
.4.1.1	Correct identity code	✓	✓	✓	Check if OK	N/A
.4.1.2	Identity period	37.0	37.0	39.0	37.5 ± 3.75	Seconds
4.2	Peak power (1) Reading of peak power meter Pm =	71mw	66 mw	70mw	N/A	Watts
	(2) Convert to dBm - 10 log Pm x 10^3 = Pm dBm	18.51 dBm	18.20 dBm	18.45 dBm	N/A	dBm
	Total power output in dBm PmdBm + P_L = *Insertion loss see 6.1 above.	51.01 dBm	50.70 dBm	50.90 dBm	50 dBm	db
4.3.3	Pulse count	7188	7236	7190	7200 ± 180	Counts
4.4.2	Pulse shape Width (50%)	3.4 µs	3.4 µs	3.4 µs	3.5 ± 0.5	µs
	Rise time (10-90%)	2.0 µs	1.8 µs	1.9 µs	2 ± 0.25	µs
	Fall time (90-10%)	2.4 µs	2.2 µs	2.5 µs	2.5 ± 0.5	µs
4.4.4	Pulse spacing	12.0 µs	12.0 µs	12.0 µs	12.0 ± 0.1	µs
.5.2	Delay - 60 ± 10 µs 15 Hz trig to first burst pulse.	✓	✓	✓	Check if OK	

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DATA SHEET
OPERATIONAL TESTS
AN/TRN-41 (Continued)

Par.	Description	5-5-77 Pre Test	5-6-77 Test	5-6-77 Post Test	Requirements	Units
3.5.3	Correct north Burst - 12 pulse pairs spaced 30 ± 0.1 μs	✓	✓	✓	Check if OK	
3.5.5	Delay 60 ± 10 μs - 135 Hz trig to first burst pulse	✓	✓	✓	Check if OK	
3.5.6	Correct Aux burst - 6 pulse pairs spaced 24 ± 0.1 μs	✓	✓	✓	Check if OK	
3.6.5	RT replies to 3300 interrogations	2600	2663	2714	≥2310 (Counts/Second)	
3.6.7	Demand only mode - times to switch from ON to STBY within 70 seconds	✓	✓	✓	Check if OK	
3.6.8	STBY mode	✓	✓	✓	Check if OK	
3.6.9	Demand Only mode - time to switch from STBY to ON ≤~~10~~ 20 sec 4/19/77	✓	✓	✓	Check if OK	
3.6.10	ON AIR mode	✓	✓	✓	Check if OK	
3.7.1	DME ONLY mode	✓	✓	✓	Check if OK	
3.7.2	Switch from DME to TACAN	✓	✓	✓	Check if OK	
3.8.1	Antenna Alarm - Within four seconds	✓	✓	✓	Check if OK	
3.8.2	Alarm Reset	✓	✓	✓	Check if OK	
3.8.3	RT Alarm - Within five seconds	✓	✓	✓	Check if OK	
3.8.4	Alarm Reset	✓	✓	✓	Check if OK	

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FACILITY: T-3	ENVIRONMENTAL DATA SHEET ENVIRONMENTAL LABORATORY — DEPT. 330	
A.O. 298K143	ENV. TECH.	TEST SCHED.
ENGINEER OR Q.C. (E Systems)	PHONE	TEST COMPLETED
TECHNICIAN	PHONE	TEST REMOVED
UNIT TITLE AN/TRN-41 (TACAN)	SER. 2 QTY. 1	TOTAL UTILIZATION

INSTRUCTIONS TO OPERATOR	TEST TO TERMINATE:	BY:	ENVIRONMENTAL LABORATORY SUPERVISORS APPROVAL
TEST ~~Low~~ Temp SPEC. E Sys 131500-415 PAR. Appendix IV-A			SIGNATURE DATE

1977 DATE	TIME	CHRONOLOGICAL RECORD OF TEST	INITIALS (PRINT)
4/26	11:30	Tacan installed into T-3. Perform functional pretest.	JCD
4/26	12:10	set temp index to 160°F	JCD
4/28	15:10	" " " " 77°F	JCD
4/28	1630	T-3 off	JCD
4/30	0945	T-3 on. Set temp index to 160°F	JCD
5/2	1250	T-3 off	JCD
5/3	1100	T-3 on. Set temp index to -85°F	JCD
5/3	1700	" " " " -65°F	JCD
5/4	0915	Cooling off. Set temp index for 0°F	JCD
	0930	" " " " 70°F	JCD
5/4	1300	T-3 off	
5/5	1100	T-3 on. Set temp index to -85°F	JCD
5/5	1730	" " " " -65°F	JCD
5/6	0930	" " " " +73°F	JCD
5/6	1100	T-3 off	JCD

VERIFIED & RELEASED BY: _____ Q.C. OR PROGRESS _____ COGNIZANT ENGINEER

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